



SEQUENCE LISTING

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YASUEDA, Hisashi
GUNJI, Yoshiya

<120> METHOD FOR PRODUCING ALCOHOL BY USING MICROORGANISM

<130>

<150> JP 2001-270903
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<170> PatentIn Ver. 2.0

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<213> Artificial Sequence

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<223> Description of Artificial Sequence:primer

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			1	5	
acc aag gcc	g	cg	ac	g	1543
Thr Lys	Ala	Ala	Thr	Asp	Ala
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Val Asn	Ala	Gln	Glu	Val	His
25	30	35	Arg	Trp	Leu
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Phe Lys	Asn	Asn	Arg	Thr	Lys
40	45	50	Tyr	Ala	Thr
gag acc aag	gaa	cag	ttc	aag	1687
Glu Thr	Lys	Glu	Gln	Phe	Lys
55	60	65	Ile	Ala	Lys
gag gca gtc	aag	gac	gaa	agg	1735
Glu Ala	Val	Lys	Asp	Glu	Arg
75	80	85	Gly	Ser	Leu
acc cgc ctc	aac	gcc	ggt	gtt	1783
Thr Arg	Leu	Asn	Ala	Gly	Val
90	95	100	Arg	Val	Arg
atg aaa	gtg	gtt	tcg	aac	1831
Met Lys	Val	Val	Ser	Asn	Phe
105	110	115	Leu	Glu	Val
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Ala Ala	Thr	Gly	Met	Gly	Asp
120	125	130	Leu	Trp	Ser
aac ggc tat	ctg	gcc	cag	gtg	1927
Asn Gly	Tyr	Leu	Ala	Gln	Val
135	140	145	Asp	Glu	Ile
tgt gcc tac	gtc	aac	tac	tac	1975
Cys Ala	Tyr	Val	Asn	Tyr	Tyr
155	160	165	Phe	Ala	Lys
ggt cac aac	gat	gtc	cgc	acc	2023
Gly His	Asn	Asp	Ala	Arg	Arg
170	175	180	Thr	Arg	Thr
ggc atg aag	cgc	gtg	ttt	tcc	2071
Gly Met	Lys	Arg	Val	Phe	Ser
185	190	195	Asp	Gly	Ile
gaa tgc tcc	ctc	aac	ctg	cag	2119
Glu Cys	Ser	Leu	Asn	Leu	Gln
200	205	210	Leu	Val	Gly
ccg ctg atc	gtc	gca	gtg	acc	2167
Pro Leu	Ile	Val	Ala	Val	Thr
215	220	225	Glu	Trp	Ala
atc acc ccg	acg	gtg	ttc	ctg	2215
Ile Thr	Pro	Thr	Val	Phe	Leu
235	240	245	Leu	Ser	Ile
atg gcc aac	ggt	tac	cag	acc	2263
Met Ala	Asn	Gly	Tyr	Gln	Thr
250	255	260	Val	Val	Ser
tcc gcc aag	tat	ctc	aac	acg	2311
Ser Ala	Lys	Tyr	Leu	Asn	Thr
265	270	275	Asp	Leu	Asn
cag aag tac	ttc	acg	ccg	gtg	2359
Gln Lys	Tyr	Phe	Thr	Pro	Val

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Lys Phe Lys Val Glu Pro Trp	Val Lys Thr Trp Asp Arg Trp Val	Tyr			
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gag gac tgg ggc ggc atc tgg	atc ggc cgt	ctg ggc aag tac	ggg gtg	2455	
Glu Asp Trp Gly Gly Ile Trp	Ile Gly Arg Leu Gly Lys Tyr Gly Val				
315	320	325			
gag tcg ccg cgc agc ctc aag	gac gcc aag cag	gac gct tac	tgg gct	2503	
Glu Ser Pro Arg Ser Leu Lys	Asp Ala Lys Gln Asp Ala	Tyr Trp Ala			
330	335	340			
cac cac gac ctg tat ctg	ctg gct tat	gcg ctg tgg	ccg acc ggc ttc	2551	
His His Asp Leu Tyr Leu	Leu Ala Tyr Ala	Leu Trp Pro	Thr Gly Phe		
345	350	355			
ttc cgt ctg gcg ctg ccg	gat cag gaa gaa	atg gag tgg	ttc gag gcc	2599	
Phe Arg Leu Ala Leu Pro	Asp Gln Glu Glu Met	Glu Trp Phe	Glu Ala		
360	365	370			
aac tac ccc ggc tgg tac	gac cac tac	ggc aag atc	tac gag gaa tgg	2647	
Asn Tyr Pro Gly Trp	Tyr Asp His	Tyr Gly Lys Ile	Tyr Glu Glu Trp		
375	380	385	390		
cgc gcc cgc ggt tgc gag	gat ccg tcc	tcg ggc ttc	atc ccg ctg	2695	
Arg Ala Arg Gly Cys	Glu Asp Pro Ser	Ser Gly Phe Ile	Pro Leu Met		
395	400	405			
tgg ttc atc gaa aac aac	cat ccc atc tac	atc gat cgc	gtg tcg caa	2743	
Trp Phe Ile Glu Asn Asn	His Pro Ile	Tyr Ile Asp Arg	Val Ser Gln		
410	415	420			
gtg ccg ttc tgc ccg	agc ttg gcc aag	ggc gcc agc	acc ctg cgc gtg	2791	
Val Pro Phe Cys Pro	Ser Leu Ala Lys	Gly Ala Ser	Thr Leu Arg Val		
425	430	435			
cac gag tac aac ggc gag	atg cac acc ttc	agc gac cag	tgg ggc gag	2839	
His Glu Tyr Asn Gly Glu	Met His Thr Phe Ser	Asp Gln Trp Gly	Glu		
440	445	450			
cgc atg tgg ctg gcc gag	ccg gag cgc tac	gag tgc cag	aac atc ttc	2887	
Arg Met Trp Leu Ala Glu	Pro Glu Arg Tyr	Glu Cys Gln Asn Ile	Phe		
455	460	465	470		
gaa cag tac gaa gga	cgc gaa ctg tcg	gaa gtg atc	gcc gaa ctg cac	2935	
Glu Gln Tyr Glu Gly Arg	Glu Leu Ser Glu Val	Ile Ala Glu	Leu His		
475	480	485			
ggg ctg cgc agt	gat ggc aag acc	ctg atc	gcc cag ccg	2983	
Gly Leu Arg Ser Asp	Gly Lys Thr	Leu Ile Ala	Gln Pro His Val		
490	495	500			
ggc gac aag ctg tgg	acg ttg gac	gat atc	aaa cgc ctg	3031	
Gly Asp Lys Leu Trp	Thr Leu Asp Asp	Ile Lys Arg	Leu Asn Cys Val		
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ttc aag aac ccg	gtg aag gca	ttc aat tga	aacgggtgtc	3081	
Phe Lys Asn Pro Val	Lys Ala Phe Asn				
520	525				
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atg agc atg tta	gga gaa aga	cgc cgc	ggt ctg	acc gat ccg	3189
Met Ser Met Leu Gly	Glu Arg Arg	Gly Leu Thr	Asp Pro	Glu Met	
1	5	10	15		
gcg gcc gtc	att ttg aag	gct ctt	gaa gct	ccg ctg	3237
Ala Ala Val	Ile Leu Lys	Ala Leu Pro	Glu Ala Pro	Leu Asp	
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aac aag atg ggt	tat ttc	gtc acc	ccc cgc	tgg aaa	3285
Asn Lys Met	Gly Tyr Phe	Val Thr	Pro Arg	Trp Lys	
35	40	45			
tat gaa gcc	ctg acc	gtt tat	gct cag	ccc aac	3333
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 Gly Gly Leu Asp Trp Gly Asp Trp Thr Gln Lys Phe His Gly Gly Arg
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 cct tcc tgg ggc aac gag acc acg gag ctg cgc acc gtc gac tgg ttc 3429
 Pro Ser Trp Gly Asn Glu Thr Thr Glu Leu Arg Thr Val Asp Trp Phe
 85 90 95
 aag cac cgt gac ccg ctc cgc cgt tgg cat gcg ccg tac gtc aag gac 3477
 Lys His Arg Asp Pro Leu Arg Arg Trp His Ala Pro Tyr Val Lys Asp
 100 105 110
 aag gcc gag gaa tgg cgc tac acc gac cgc ttc ctg cag ggt tac tcc 3525
 Lys Ala Glu Glu Trp Arg Tyr Thr Asp Arg Phe Leu Gln Gly Tyr Ser
 115 120 125
 gcc gac ggt cag atc cgg gcg atg aac ccg acc tgg cgg gac gag ttc 3573
 Ala Asp Gly Gln Ile Arg Ala Met Asn Pro Thr Trp Arg Asp Glu Phe
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 Ile Asn Arg Tyr Trp Gly Ala Phe Leu Phe Asn Glu Tyr Gly Leu Phe
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 aac gct cat tcg cag ggc ccg gag gcg ctg tcg gac gta acc cgc 3669
 Asn Ala His Ser Gln Gly Ala Arg Glu Ala Leu Ser Asp Val Thr Arg
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 Val Ser Leu Ala Phe Trp Gly Phe Asp Lys Ile Asp Ile Ala Gln Met
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 Ile Gln Leu Glu Arg Gly Phe Leu Ala Lys Ile Val Pro Gly Phe Asp
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 gag tcc aca gcg gtg ccg aag gcc gaa tgg acg aac ggg gag gtc tac 3813
 Glu Ser Thr Ala Val Pro Lys Ala Glu Trp Thr Asn Gly Glu Val Tyr
 210 215 220
 aag agc gcc cgt ctg gcc gtg gaa ggg ctg tgg cag gag gtg ttc gac 3861
 Lys Ser Ala Arg Leu Ala Val Glu Gly Leu Trp Gln Glu Val Phe Asp
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 Trp Asn Glu Ser Ala Phe Ser Val His Ala Val Tyr Asp Ala Leu Phe
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 Gly Asp Asn Leu Thr Pro Phe Phe Ile Asn Gln Ala Gln Thr Tyr Phe
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 Gln Ile Ala Lys Gln Gly Val Gln Asp Leu Tyr Tyr Asn Cys Leu Gly
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 Asp Asp Pro Glu Phe Ser Asp Tyr Asn Arg Thr Val Met Arg Asn Trp
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 Gly Leu Phe Ala Lys Leu Pro Ala Gly Thr Thr Asp Lys Glu Glu Ile
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Thr Ala Sér Leu Tyr Arg Val Val Asp Asp Trp Ile Glu Asp Tyr Ala
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 Leu Ala Gly Leu Lys Met Ser Val Asn Ser Asn
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 Gln Phe Phe Ala Asp Glu Asn Gln Val Val His Glu Ser Asp Thr Val
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 Val Leu Val Leu Lys Lys Ser Asp Glu Ile Asn Thr Phe Ile Glu Glu
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 Tyr Asp Phe Leu Val Asp Val Ser Ser Thr Ile Gly Arg Ala Tyr Thr
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 Leu Gly Asn Lys Phe Thr Ile Thr Ser Glu Leu Met Gly Leu Asp Arg
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 Lys Leu Glu Asp Tyr His Ala Met Ala Lys Leu Gly
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 Ile His Ser Asn Asp Thr Arg Asp Ala Trp Val Asn Lys Ile Ala Gln
 10 15 20 4826
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 Asp His Thr Thr Pro Phe Arg Asn Ser Tyr Glu Leu Asp Asn Asp Tyr
 40 45 50 4922
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 Leu Trp Ile Glu Ala Lys Leu Glu Glu Lys Val Ala Val Leu Lys Ala
 55 60 65 4970
 cgc gcc ttc aac gag gtg gac ttc cgt cat aag acc gct ttc ggc gag
 Arg Ala Phe Asn Glu Val Asp Phe Arg His Lys Thr Ala Phe Gly Glu
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 gat gcc aag tcc gtt ctg gac ggc acc gtc gcg aag atg aac gcg gcc
 Asp Ala Lys Ser Val Leu Asp Gly Thr Val Ala Lys Met Asn Ala Ala
 90 95 100 5066
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 Lys Asp Lys Trp Glu Ala Glu Lys Ile His Ile Gly Phe Arg Gln Ala
 105 110 115 5114
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Tyr Lys Pro Pro Ile Met Pro Val Asn Tyr Phe Leu Asp Gly Glu Arg
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 cag ttg ggg acc cgg ctg atg gaa ctg cgc aac ctc aac tac tac gac 5210
 Gln Leu Gly Thr Arg Leu Met Glu Leu Arg Asn Leu Asn Tyr Tyr Asp
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 Thr Pro Leu Glu Glu Leu Arg Lys Gln Arg Gly Val Arg Val Val His
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 Ile Ser Phe Gly Glu Val Gly Ser Phe Glu Ala Glu Val Val Gly Leu
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 Asn Trp Val Ser Ser Asn Thr Val Gln Phe Leu Leu Gln Lys Arg Pro

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Asp Glu Cys Gly Asn Arg Gly Val Lys Phe Glu Pro Gly Gln Phe Met			
135	140	145	
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Asp Leu Thr Ile Pro Gly Thr Asp Val Ser Arg Ser Tyr Ser Pro Ala			
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Asn Leu Pro Asn Pro Glu Gly Arg Leu Glu Phe Leu Ile Arg Val Leu			
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Pro Glu Gly Arg Phe Ser Asp Tyr Leu Arg Asn Asp Ala Arg Val Gly			
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Gln Val Leu Ser Val Lys Gly Pro Leu Gly Val Phe Gly Leu Lys Glu			
200	205	210	
cgg ggc atg gcg ccc cgc tat ttc gtg gcc ggc acc ggg ttg gcg			6439
Arg Gly Met Ala Pro Arg Tyr Phe Val Ala Gly Gly Thr Gly Leu Ala			
215	220	225	
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Pro Val Val Ser Met Val Arg Gln Met Gln Glu Trp Thr Ala Pro Asn			
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Glu Thr Arg Ile Tyr Phe Gly Val Asn Thr Glu Pro Glu Leu Phe Tyr			
245	250	255	260
atc gac gag ctc aaa tcc ctg gaa cga tcg atg cgc aat ctc acc gtg			6583
Ile Asp Glu Leu Lys Ser Leu Glu Arg Ser Met Arg Asn Leu Thr Val			
265	270	275	
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Lys Ala Cys Val Trp His Pro Ser Gly Asp Trp Glu Gly Glu Gln Gly			
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Ser Pro Ile Asp Ala Leu Arg Glu Asp Leu Glu Ser Ser Asp Ala Asn			
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Pro Asp Ile Tyr Leu Cys Gly Pro Pro Gly Met Ile Asp Ala Ala Cys			
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Glu Leu Val Arg Ser Arg Gly Ile Pro Gly Glu Gln Val Phe Phe Glu			
325	330	335	340
aaa ttc ctg ccg tcc ggg gcg gcc tga accggggaaat taccgtgacc			6822
Lys Phe Leu Pro Ser Gly Ala Ala			
345			
accgagcagt tccccccccca attcctgcgt gaaatgatcg agcagctgga cgccagcatc			6882
caggagctcg cacgcaagga aaaggactt gcggcatccc tgggcacggg cgggtcgcc			6942
gagctcaagg aatactggga ccacgttctc actccccagg aggaatggga gctcaagcga			7002
ccatggactt ccgcgaccgg gaactgggtgt ggatctggtc ccgtctcagg cggcccccga			7062
cctcccgccca caatgccccgg gaggcctata tcgcccagctg tcgccccggc cgcgaaaaaa			7122
cgaacaatcc tgaaacggag tcgacggta tcgttggaa aaaggttata tgtcgcccta			7182
tttgtt			7188

□